

SPECIFICATION AMENDMENTS:

Please replace the section entitled “**BRIEF DESCRIPTION OF THE DRAWINGS**” with the following amended section:

--BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will become more fully understood from the detailed description given herein below illustration only, and thus are not limitative of the present invention, and wherein:

FIG. 1 is a perspective view of a paper pickup mechanism according to one embodiment of the invention, the broken line indicating the boundary of a ~~feeder~~ feed tray;

FIG. 2 is a perspective view of a paper pickup mechanism taken from a different angle of view according to one embodiment of the invention, the broken line indicating the boundary of the ~~feeder~~ feed tray;

FIG. 3 is a schematic view illustrating the operation of a paper pickup mechanism outside a ~~feeder~~ feed tray when paper is not picked up, according to one embodiment of the invention;

FIG. 4 is a schematic view illustrating the operation of a paper pickup mechanism inside a ~~feeder~~ feed tray when paper is not picked up, according to one embodiment of the invention;

FIG. 5 is a schematic view illustrating the operation of a paper pickup mechanism outside a ~~feeder~~ feed tray when paper is picked up, according to one embodiment of the invention; and

FIG. 6 is a schematic view illustrating the operation of a paper pickup mechanism inside a ~~feeder~~ feed tray when paper is picked up, according to one embodiment of the invention.--

Please replace the section entitled “**DETAILED DESCRIPTION OF THE INVENTION**” with the following amended section:

--DETAILED DESCRIPTION OF THE INVENTION

Referring to FIG. 1 to FIG. 6, a paper pickup mechanism 100 according to one preferred embodiment of the invention is mounted on a vertical type feed tray 200. The paper pickup mechanism 100 includes a ~~set of driving gears~~ gear set 110, a pickup roller 120, a set of swing arms 130, a twist limiter 140 and a twist restricting gear 150. The arrangement and operation of the above components are described below.

Referring to FIG. 1 and FIG. 2, the ~~set of driving gears~~ gear set 110 includes a ~~power input driving gear~~ driving gear 111, a first ~~internal driven gear~~ internal driven gear 112, a second ~~internal driven gear~~ internal driven gear 113, a transmission gear 114, a first connecting rod 115 and a second connecting rod 116. The ~~power input driving gear~~ driving gear 111 inputs a driving power. The first and second ~~internal driven gears~~ internal driven gears 112, 113 engage with each other. The ~~power input driving gear~~ driving gear 111 engages with the first ~~internal driven gear~~ internal driven gear 112. The second ~~internal driven gear~~ internal driven gear 113 further engages with the transmission gear 114. The ~~power input driving gear~~ driving gear 111, the first ~~internal driven gear~~ internal driven gear 112 and the second ~~internal driven gear~~ internal driven gear 113 interconnect with the first connecting rod 115

of a substantial L shape. The second ~~internal~~ driven gear 113 and the transmission gear 114 interconnect with the second connection rod 116. In the above configuration, the transmission gear is movably located at the lowest position. When the ~~power input~~ driving gear 111 rotates to drive the related gears in rotation, friction between the gears and the connecting rods drives the transmission gear 114 ~~in rotation and~~ to rotate and move in a sliding move motion. Furthermore, the transmission gear 114 pivotally connects with a pickup shaft 121 that extends through a sidewall slot 210 into a ~~feeder~~ feed tray 200.

The pickup roller 120 has a high-friction picking surface to contact with the paper to be fed. The pickup roller 120 is mounted inside the ~~feeder~~ feed tray 200 to pivotally connect to the pickup shaft 121. The sidewall slot 210, through which the pickup shaft ~~200~~ 121 penetrates, has a profile shaped in an inclined arcuate curve. The sidewall slot 210 has an inner radius larger at its top edge than at other portions, to position the transmission gear 114 at a higher level when the transmission gear 114 is not in operation. In other words, the pickup roller 120 is also located at a higher level so that the inner space of the ~~feeder~~ feed tray is larger for greater paper load.

The set of swing arms 130 includes a first arm 131 and a second arm 132 which connect to each other. A top of the first arm 131 connects to a suspended arm 220 that stretches across the ~~feeder~~ feed tray 200. A bottom of the swing second arm 132 connects to the pickup roller 120.

The twist limiter 140 is mounted ~~outside~~ on outer side the ~~feeder-feed~~ tray 200, below the transmission gear 114 relatively. The twist restricting gear 150 is disposed on one side of the twist limiter 140 and pivotally connects to the transmission gear 114 in a manner that when the transmission gear 114 ~~moves~~ rotates, the transmission gear 114 engages with the twist restricting gear 150. The twist limiter 140 provides a predetermined twist force to the twist restricting gear 150. The twist restricting gear 150 rotates only when a twist force proved by the gear set 110 is greater than a ~~the~~ predetermined twist force is applied thereon. The predetermined twist force is determined based on the twist force required for conveying the paper when the pickup roller 120 contacts with the paper. Practically, the twist limiter 140 is a twist spring or other damping device. If a damping fluid is applied over the shaft of the twist restricting gear 150 to provide enough resistance, the twist limiter 140 can be omitted.

Referring to FIG. 3 and FIG. 4 in conjunction with FIG. 1 and FIG. 2, in the paper pickup operation, the ~~power input roller~~ driving gear 111 provides a counterclockwise rotational force to sequentially drive the first and second ~~internal~~ driven gears 112, 113 and the transmission gear 114 in rotation, the transmission gear 114 descends from the top edge of the sidewall slot 210 until it contacts with the twist restricting gear 150. The pickup roller 120 rotates and moves as the transmission gear 114 acts. The pickup roller 120 and the transmission gear 114 are movable. Therefore, the twist force supplied by the power source does not need to be as high as that supplied by the twist limiter 140. In other words, the

twist restricting gear 150 does not rotate at this moment, and the transmission gear 114 moves toward a paper 230 and, meanwhile, rotates and engages with the twist restricting gear 150.

Referring to FIG. 5 and FIG. 6, after the pickup roller 120 comes in contact with the paper 230, the friction between the pickup roller 120 and the paper 230 increases the twist force required to keep the transmission gear 114 rotating. When the twist force transmitted from the ~~set of driving gears~~ gear set 110 is greater than the predetermined twist force of the twister limiter 140, the twist restricting gear 150 and the transmission gear 114 are driven in rotation simultaneously to drive the pickup roller 120 to convey the paper 230. When the paper 230 moves to the feeding roller (not shown), the power source supplies a reverse twist force to allow the above components to turn back to their original positions.

As described above, the transmission gear is supplied with a predetermined twist force to limit the pickup force to a constant value regardless of the paper load, which may include 200 or 5 paper sheets. Furthermore, with the twist restricting gear, the moving path of the pickup roller is well controlled to increase operational precision.

To achieve an automatic compensation under different paper loads, a twist force adjustment means may be further provided to adjust the predetermined twist force.

It is noted that the mechanism used to drive the transmission gear and pickup roller is not limited to those described above. For example, the number and arrangement of swing arms are not particularly limited to the above embodiments. A person skilled in the art can readily understand that the swing arms are equivalent to the connecting rods. The ~~set of driving gears~~ gear set may include, in addition to the transmission gears, various assemblies of gears and connecting rods. Furthermore, the number of sets of driving gears is not particularly limited to the description herein.

Furthermore, the transmission gear, the twist limiter and the twist restricting gear may be located at positions other than the outside of the ~~feeder~~ feed tray. One variation of the paper pickup mechanism of the invention can be also applied to a transversal type ~~feeder~~ feed tray.

The invention being thus described, it will be obvious that the same may be varied in many ways. Such variations are not to be regarded as a departure from the spirit and scope of the invention, and all such modifications as would be obvious to one skilled in the art are intended to be included within the scope of the following claims.--